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Test 1160: Case 1270 Diesel

Tractor Museum
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NEBRASKA TRACTOR TEST 1160 – CASE 1270 DIESEL

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Temperature Degrees F Air wet bulb	Temperature Degrees F Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1050 rpm)								
135.39	2100	9.769	0.500	13.86	192	66	75	28.523
Standard Power Take-off Speed (1000 rpm)—One Hour								
135.41	2000	9.514	0.487	14.23	193	66	75	28.540
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
118.18	2158	8.798	0.516	13.43	187	66	76	.....
0.00	2274	3.119	.....	.....	176	65	73	.....
61.03	2229	5.869	0.667	10.40	186	66	74	.....
137.00	2100	9.810	0.497	13.97	193	64	76	.....
30.83	2252	4.425	0.995	6.97	178	66	76	.....
90.19	2196	7.232	0.556	12.47	187	66	76	.....
Av 72.87	**2202**	**6.542**	**0.623**	**11.14**	**184**	**65**	**75**	**28.580**

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Temp Degrees F Air wet bulb	Temp Degrees F Air dry bulb	Barometer inches of Mercury
VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST											
Maximum Available Power—Two Hours—6th Gear (3-Lo)											
116.77	9211	4.75	2102	6.48	9.606	0.571	12.16	191	64	77	28.530
75% of Pull at Maximum Power—Ten Hours—6th Gear (3-Lo)											
95.88	7141	5.04	2191	4.88	8.348	0.604	11.49	187	58	64	28.593
50% of Pull at Maximum Power—Two Hours—6th Gear (3-Lo)											
65.89	4750	5.20	2226	3.35	6.668	0.702	9.88	183	56	68	28.860
50% of Pull at Reduced Engine Speed—Two Hours—8th Gear (3-Int)											
65.48	4731	5.19	1665	3.20	5.244	0.556	12.49	183	62	74	28.895
MAXIMUM POWER WITH BALLAST											
94.97	15648	2.28	2168	14.71	2nd Gear (1-Int)			186	58	65	28.530
120.80	10946	4.14	2100	7.41	5th Gear (2-Int)			189	57	65	28.530
120.85	9516	4.76	2101	6.11	6th Gear (3-Lo)			189	57	65	28.520
119.64	8524	5.26	2100	5.52	7th Gear (2-Hi)			190	59	67	28.530
121.83	7072	6.46	2102	4.54	8th Gear (3-Int)			190	60	70	28.530
119.33	5454	8.20	2101	3.00	9th Gear (3-Hi)			190	62	72	28.530

VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST
6th Gear (3-Lo)

Pounds Pull	9516	10560	11148	11580	10826	9950
Horsepower	120.85	119.58	111.86	101.01	81.65	70.45
Crankshaft Speed rpm	2101	1887	1681	1468	1260	1176
Miles Per Hour	4.76	4.25	3.76	3.27	2.83	2.66
Slip of Drivers %	6.11	6.91	7.34	8.19	7.06	6.62

TRACTOR SOUND LEVEL (with cab)	**dB (A)**
Maximum Available Power 2 Hours	82.5
75% of Pull at Max. Power 10 Hours	83.0
50% of Pull at Max. Power 2 Hours	83.0
50% of Pull at Reduced Engine Speed 2 Hours	80.5
Bystander (12th Gear 4-Hi)	88.5

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi	Four 18.4-38;8;16	Four 18.4-38;8;16
Ballast	—Liquid	810 lb each	None
	Cast Iron	None	None
Front Tires	—No., size, ply & psi	Two 10.00-16; 6;28	Two 10.00-16;6;28
Ballast	—Liquid	None	None
	Cast Iron	100 lb each	None
Height of drawbar		21 inches	21 inches
Static weight with operator—	rear	14860 lb	11620 lb
	front	4050 lb	3850 lb
	total	18910 lb	15470 lb

Department of Agricultural Engineering

Dates of Test: June 3 to June 11, 1974

Manufacturer: J. I. CASE COMPANY, RACINE, WISCONSIN

FUEL, OIL AND TIME **Fuel** No 2 Diesel **Cetane No** 51.9 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8330 **Weight per gallon** 6.936 lb **Oil SAE** 30 **API service classification** CC CD SC SD SE **To motor** 4.628 gal **Drained from motor** 4.322 gal **Transmission and final drive lubricant** CASE TFD Fluid **Total time engine was operated** 48½ hours.

ENGINE **Make** J. I. CASE Diesel **Type** 6 cylinder with turbocharger **Serial No** 2541761 **Crankshaft mounted** lengthwise **Rated rpm** 2100 **Bore and stroke** 4⅜" x 5" **Compression ratio** 15.8 to 1 **Displacement** 451 cu in **Cranking system** 12 volt electric **Lubrication** pressure **Air cleaner** dry type two stage with replaceable pleated paper elements and precleaner **Oil filter** two parallel full flow replaceable pleated paper screw-on cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil and radiator for transmission and hydraulic fluid **Fuel filter** replaceable primary and secondary screw-on cartridges **Muffler** vertical **Cooling medium temperature control** two thermostats.

CHASSIS **Type** standard **Serial No** 8740137 **Tread width** rear 64" to 109" front 60" to 88" **Wheel base** 104" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 29.6" Vertical distance above roadway 39.5" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial range operator controlled power shift **Advertised speeds mph** first 1.9 second 2.6 third 3.2 fourth 3.3 fifth 4.4 sixth 5.0 seventh 5.5 eighth 6.7 ninth 8.4 tenth 10.6 eleventh 14.2 twelfth 17.7 reverse 3.2, 5.5 and 8.4 **Clutch** multiple disc wet clutches actuated hydraulically **Brakes** internal wet disc hydraulically operated by independent foot pedals **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 148" left 148" (on concrete surface without brake) right 172" left 172" **Turning space diameter** (on concrete surface with brake applied) right 307" left 307" (on concrete surface without brake) right 356" left 356" **Power take-off** 1000 rpm at 2000 engine rpm.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure.

First gear was not run as it was necessary to limit the pull in second gear because of excessive wheel slippage. Third, fourth, tenth, eleventh, and twelfth gears were not run as test procedure requires only six travel speeds.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1160.**

L. F. LARSEN
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
D. E. LANE
Board of Tractor Test Engineers

The University of Nebraska Agricultural Experiment Station
H. W. Ottoson, Director and Acting Dean

EXPLANATION OF TEST REPORT

GENERAL CONDITIONS

Each tractor is a production model equipped for common usage. Power consuming accessories can be disconnected only when it is convenient for the operator to do so in practice. Additional weight can be added as ballast if the manufacturer regularly supplies it for sale. The static tire loads and the inflation pressures must conform to recommendations in the Tire Standards published by the Society of Automotive Engineers.

PREPARATION FOR PERFORMANCE RUNS

The engine crankcase is drained and refilled with a measured amount of new oil conforming to specifications in the operators manual. The fuel used and the maintenance operations must also conform to the published information delivered with the tractor. The tractor is then limbered-up for 12 hours on drawbar work in accordance with the manufacturer's published recommendations. The manufacturer's representative is present to make appropriate decisions regarding mechanical adjustments.

The tractor is equipped with approximately the amount of added ballast that is used during maximum drawbar tests. Prior to the maximum power run the tire tread-bar height must be at least 65% of new tread height.

POWER TAKE-OFF PERFORMANCE

Maximum Power and Fuel Consumption. The manufacturer's representative makes carburetor, fuel pump, ignition and governor control settings which remain unchanged throughout all subsequent runs. The governor and the manually operated governor control lever is set to provide the high-idle speed specified by the manufacturer for maximum power. Maximum power is measured by connecting the power take-off to a dynamometer. The dynamometer load is then gradually increased until the engine is operating at the rated speed specified by the manufacturer for maximum power. The corresponding fuel consumption is measured.

Varying Power and Fuel Consumption. Six different horsepower levels are used to show corresponding fuel consumption rates and how the governor causes the engine to react to the following changes in dynamometer load: 85% of the dynamometer torque at maximum power; minimum dynamometer torque, ½ of the 85% torque; maximum power, ¼ and ¾ of the 85% torque. Since a tractor is generally subjected to varying loads the average of the results in this test serve well for predicting the fuel consumption of a tractor in general usage.

DRAWBAR PERFORMANCE

All engine adjustments are the same as those used in the belt or power take-off tests.

Varying Power and Fuel Consumption With Ballast. The varying power runs are made to show the effects of speed-control devices (engine, governor, automatic transmission, etc.) on horsepower, speed and fuel consumption. These runs are made around the entire test course which has two 180 degree turns with a minimum radius of 50 feet. The drawbar pull is set at 4 different runs as follows: (1) as near to the pull at maximum power as possible and still have the tractor maintain the travel speed at maximum horsepower on the straight sections of the test course; (2) 75% of the pull at maximum power; (3) 50% of the pull at maximum power; and (4) maintaining the same load and travel speed as in (3) by shifting to a higher gear and reducing the engine rpm.

Maximum Power with Ballast. Maximum power is measured on straight level sections of the test course. Data are shown for not more than 6 different gears or travel speeds. Some gears or travel speeds may be omitted because of high slippage of the traction members or because the travel speed may exceed the safe limit for the test course. The manufacturer's representative has the option of selecting one gear or speed over eight miles per hour. The maximum safe speed for the Nebraska Test Course has been set at 15 miles per hour. The slippage limits have been set at 15% and 7% for pneumatic tires and steel tracks or lugs, respectively. Higher slippage gives widely varying results.

Varying Drawbar Pull and Travel Speed with Ballast. Travel speeds corresponding to drawbar pulls beyond the maximum power range are obtained to show the "lugging ability" of the tractor. The run starts with the pull at maximum power; then additional drawbar pull is applied to cause decreasing speeds. The run is ended by one of three conditions: (1) maximum pull is obtained, (2) the maximum slippage limit is reached, or (3) some other operating limit is reached.

SOUND MEASUREMENT

Sound is recorded during each of the Varying Power and Fuel Consumption runs as the tractor travels on a straight section of the test course. The dB(A) sound level is obtained with the microphone located near the right ear of the operator. Bystander sound readings are taken with the microphone placed 25 feet from the line of travel of the tractor.

An increase of 10 dB(A) will approximately double the loudness to the human ear.

For additional information about the **Nebraska Tractor Tests** write to the **Department of Agricultural Engineering, University of Nebraska, Lincoln, Nebraska 68503.**

CASE 1270 DIESEL